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OUR POST GRADUATE COURSE

SOME DENTAL DICTA.

ELBERT HUBBARD.

Horace Fletcher is Professor of Vital Economics in the University of Hardknocks. Also, he holds a similar chair in all of the leading universities of the world.

It is estimated that Fletcher is saving the world in its food supply over a quarter of a million dollars a day. Here is the way I figure it: Fletcher has two million students who got the idea directly from him or his books. By perfect mastication these students cut down their food supply fully one-third, or a saving of twelve and a half cents a day for each.

But the gain in fletcherizing is not so much in the saving of food as through the increased effectiveness of the individual. To have the courage to tackle problems and dispose of them is the rule with the man who fletcherizes. It kills the taste for strong drink and puts that tired feeling on the toboggan.

FLETCHERIZE!

The middle name of every dentist should be Fletcher.

Horace Fletcher will live in history as the first man who insisted that our teeth were given us for use.

He is the first man who told us that the failure to use the teeth properly is a sin.

He is the first man to say that a dietetic sinner is no more beautiful in the eyes of God than a boozer or any other sinner against the flesh.

In the face of ridicule and stupidity Horace Fletcher has held his course for twenty years.

Now his name is honored wherever thinking men and women live, the round world over.

Recently Mr. Fletcher spent a week at The Roycroft Shop. We chewed the subject of dietetics from A to Z, as we picked up potatoes in the field or climbed the hills 'cross lots.

CHEW! CHEW!

Mr. Fletcher gave three formal lectures in The Roycroft Chapel to the people of the town, spoke to the school-children, and made himself useful at the wood-pile.

Not many men live up to what they preach. Horace Fletcher does. And by his life he proves the beauty of his theories. He is well, strong, amiable, intelligent, industrious, happy, and at sixty he is twenty per cent stronger than he was at forty.

An adult has an alimentary canal about thirty-two feet long, but the owner can control only the first three inches of it. After that all he can do is to set up an explosion.

To use your mouth as a civilized man should is a fine art—so insists Horace Fletcher.

He declares that the day of the dentist is at hand. Heretofore we have gone to the dentist only when we had to.

In future we will visit the dentist early in the game. He will be our best friend.

And we will pay him; for he it is who will teach us prophylaxis, or the science of prevention.

CHILDREN'S DENTISTRY.

The care of the teeth is an important factor in the care of the child. The mental and physical efficiency of school-children can be greatly aided by the proper care of the mouth and teeth. This is fully attested by experiments in Germany which cover a wide field. There dental infirmaries connected with the schools have been in operation long enough to demonstrate:

1. That the time expended in putting the teeth in order was far less than the time formerly lost from toothache and disability caused by diseased teeth.

2. That the cost of keeping the teeth in order was more than compensated for by better health and a consequent reduction in medical expenses.

3. That the child became physically stronger, secured a higher average in his studies, was easier to control and was apparently happier. A clean mouth and clean teeth furnish one of the best protec-

tions against disease. A child forced to swallow the discharges from an unclean mouth, and having nutrition interfered with by his inability to chew his food, is unable to resist disease.

The condition of the teeth is a telltale as to diet. They are the guards which stand at the gateway to the body, ready to divide the food into manageable portions, to bring peace of mind and healthful bodily activity. No greater killjoy exists than dyspepsia; no more vicious menace to life and efficiency obtains than a disordered condition of the process of nutrition.

Cancer of the stomach is notoriously a disease of gross feeders. Eighty per cent of the cancers of the stomach arise from bolted food. If an ounce of prevention is ever worth a pound of cure, it is keeping the teeth in good condition.

THE KIND OF MAN.

A dentist to be successful must be a surgeon, an artist, a sculptor and a mechanic. He must have the same mental grasp of the laws of physics, chemistry and biology as is needed by the physician. He must have the manipulative skill that is required by the surgeon in his most delicate work. He must be able to take advantage of the finest requirements of the mechanic, and must have the ability to carry out those mechanical operations on living tissue in such manner as to cause no irritation thereto. His workshop is a hole in the face about two inches in diameter; in that hole he has to perform all of his operations and the patient takes the work away with him.

In nine-tenths of the work done by the physician or surgeon, Nature is expected to complete what he leaves. The dentist has to do his work. His failures stand out where he can always see them. The doctor buries his.

Many deaths of infants are due to the physician's ignorance of the terrible effects of interrupted dentition.

Most diseases are greatly aggravated by unsanitary oral conditions that the physician ignores completely, but that every dentist appreciates. I venture the assertion that half the diseases that take toll of mankind will be controlled when dentistry has succeeded in teaching people to keep their mouths clean, and their teeth in condition to masticate their food properly and vigorously.

The beauty, vigor and health of the human body and mind are greatly dependent on the possession of sound, useful, masticating

apparatus. Isn't the man who is able to control this situation worthy of equal honor with the writer of prescriptions? Isn't he a bigger man? Doesn't he deserve more credit? It takes him just as long to acquire his education. The dental course consists of three years of thirty-four weeks each, exclusive of holidays. He has to work from nine to five for six days every week. This course requires more hours' work than is covered by a three-year medical course. The dental student is grounded in the same fundamental subjects, such as anatomy, physiology, chemistry, histology, materia medica, pathology, bacteriology, etc., besides the many special subjects belonging solely to dentistry.

WHAT DENTISTRY HAS DONE.

Dentistry gave anesthesia to the world (Wells and Morton both being dentists), and a Cleveland dentist is today teaching the medical profession how prolonged anesthesia can be secured with almost perfect safety without the use of a dangerous chloroform or the sickening ether. The medical men, however, attempt to take the honor of anesthesia to themselves, just as they have claimed the honor of bacteriology, which was developed by Pasteur, an obscure chemist, whom the medical men were too supercilious to listen to for years.

PATIENCE AND POISE.

There is another thing to which I want to direct your attention in connection with the dentist's shop. The man in his care is usually in a bad humor. He does not go to the dentist until he has to, as a rule, and as soon as he gets there he begins to fuss about countless other things he would rather be doing; as a result he gets peevish and will not sit still. The dentist has to show consideration. He must be tolerant. He has to do all the smiling, both for his patient and for himself. His best efforts are seldom appreciated. He is commonly regarded as a disagreeable necessity. His task is a thankless one; and because as a rule he is square and honest, and charges by the hour or by the operation, he does not make as much money as he ought to make. A surgeon can put up a bluff. He can make a mountain out of a mole-hill and charge the price for removing a tumor when he takes out a wart, and the patient will never be any the wiser. The most the physician has to do is to look wise and let Nature take her course. Native has precious little to do with the restoration of teeth in the human mouth.

When I say a dentist has to be an artist, I mean he must have a knowledge of color, which enables him to properly match missing teeth with those remaining. When I say he must be a sculptor, I mean he must have a knowledge of symmetry which will enable him to restore contours either in gold or silver or cement.

From the best information I can get, I do not believe that more than four per cent of the population of this great country of ours regularly patronize the dentist. Of course, I exclude the man who patronizes him only to the extent of having a tooth extracted when he can no longer stand the pain. I do not believe that more than four per cent of our people go to him regularly and take proper care of their teeth. I am not only selfish when I say that I wish means could be devised to bring another four per cent into line. If the masses of our people appreciated the importance of the subject, the task would be an easy one.

The dentists of the United States consume annually from seven to eight million dollars' worth of pure gold. By that I mean that they hammer that much gold into the mouths of their patients, or else put it there in the shape of gold crowns and bridge-work. It is rather startling to think that there is this much pure gold each and every year being absolutely wiped out of existence, which ultimately finds its way into the graveyard, where it can never be recovered. Gold that is turned into jewelry or money or is hid away will sooner or later—the most of it at any rate—find its way back into circulation, but the gold that is consumed by the dental profession absolutely disappears forever and always.

If you are inclined to think that seven or eight million dollars is an excessive amount, I would say that it is estimated there are forty thousand dentists in this country, and that twenty dollars' worth of gold for each of them I should regard as an extremely conservative estimate of what they will use. And in my opinion no better use can be made of the yellow metal.—*The Fra.*

Our Foreign Department

THOMAS L. LARSENEUR, D. D. S., Foreign Department Editor

PAINLESS DENTAL DISEASE AS A CAUSE OF NEURASTHENIA AND INSANITY.

(*The Dental Surgeon,* London, Oct. 30th, 1909.)

The multiplicity of casual factors to which the development of neurasthenia and of insanity is attributed is an indication of our ignorance on the subject. That cause and effect are integrally related is axiomatic, but when the same effect apparently is produced by a variety of causes, we begin to doubt the genuineness of the latter, and feel that we have not advanced far in the matter of etiology.

It has long been known that irregular teeth are common in the insane and among habitual criminals, as well as in the epileptic, but hitherto it seems that there has been no attempt to establish or to disprove a casual connection between dental affections and nervous mental diseases.

Irregularity of the teeth has been regarded as one of the stigmata of degeneration, a group of anatomical and physiological peculiarities which is constantly being added to in a curiously unscientific way, and they have usually been considered as the outward expression of some unknown constitutional *tare.*

It has remained for Dr. Henry S. Upson, Professor of Neurology in the Western Reserve Medical School of Cleveland, to suggest that dental trouble may be the actual cause of certain cases of neurasthenia and insanity. In the *Cleveland Medical Journal* for August he adduces interesting, if not altogether convincing facts, in support of his somewhat novel views.

One of the simplest dental lesion is impaction. When a tooth is formed in the maxilla with its axis wrongly directed it is often prevented by impaction against another tooth from appearing outside the

bone or through the gum. The result in some instances is severe toothache or neuralgia, but in most cases no such pain is present.

Systematic examination with the help of the X-rays of a large number of patients in three of the State Hospitals revealed a considerable number of cases of impaction among patients suffering from one or other of the psychoses. Prompt recovery from insomnia and melbers of cases in which definite nervous and mental symptoms vanancholia after the relief of dental lesions in a few led Dr. Upson to prosecute his enquiry more widely, and in his paper he records numished at varying intervals after a visit to the dentist.

A series of excellent X-ray photographs illustrates the type of dental affection-impaction, the removal of which seems to have been followed by such beneficial results. We cannot doubt the reality of the improvement achieved, although it is permissable to question the accuracy of the nervous or mental diagnosis in some instances. Further, when we consider the extent of our actual dental knowledge, such a statement as "of all cases of neurastenia and the psychoses, not due to obvious physical causes, such as digestive disorders and eye-strain, the great majority, possibly four-fifths in men and three-fifths in women, are due to dental diseases," is a little too sanguine, even when we admit the enthusiasm of a worker in a new field of research.

The phenomenon of reflex irritation is accountable for much in nervous symptomatology, and no therapeusis is sufficient which ignores obvious sources of irritation, such as adenoids, dental caries, balanitis and perputial adhesions, aural mischief, astigmatism, and so on; but Dr. Upson maintains that impaction commonly occurs without any symptom, in particular without pain, and yet we are asked to recognize it as a *causa vera* of dementia praecox, melancholia, manic-depressive insanity, neurasthenia, the psychoses, and what not.

Of course, in many dental affections pain may be the exception, although reflex irritation may all the time be at work, but as a rule, the latter shows itself in local reactions merely, such as facial neuralgia, and more generally as headache and sleeplessness. Whether to its action more profound disturbances are to be attributed remains to be seen, and Dr. Upson is himself conscious of the need for further investigation so that the evidence be deemed conclusive.—*Lancet.*

TREATMENT OF APHTHAE.

(*L'Odontologie,* Paris, Nov. 15th, 1909.)

Aphthae when not associated with grave constitutional affections, such as aphthous stomatitis of aphthae fever, is considered as a mild affection which may be very painful to the subject and it may also become very annoying on account of its frequent reapparition in certain cases and with certain subjects.

The therapeutic of aphthae, according to M. Fargin-Fayolle, should be of the same nature as that of the soft chancre, that is, the immediate transformation of a specific ulceration into a commonly termed cancre sore which will readily heal with a treatment of silver-nitrate or chromic acid. But unfortunately, these agents will not generally destroy the ulceration in depth.

The electro-cautery may be used successfully as to the cure, but its application is indeed very painful.

On the contrary, the destruction of apthae may be effected painless by the use of sulphuric acid of Nordhausen. Its application will give immediate relief, its mode of application only requires a little care.

Cauterization with two pencils, as advocated by M. Sabouraud in the local treatment of fungous or ulcerous scrogulo-dermatitis, applied to the treatment of aphthae by M. Fargin-Fayolle, gives good results.

This treatment consists in a double cauterization using the two pencils. The first by using the silver-nitrate pencil and the second with the metallic zinc pencil. The affected part is first touched with the silver-nitrate pencil, this area will soon take a whitish tint which will rapidly be followed by a black coloration as soon as the zinc pencil is applied. This is due to the double decomposition which takes place giving rise to formation to free nitric acid.

The zinc pencil, following this should be thoroughly washed.

The use of trichloracetic acid or of the acid nitrate of mercury may give excellent results, but their use is very dangerous.—(*Revue de Dermatologie,* Aug., 1909.)

ON THE TREATMENT OF APHTHAE WITH LOCAL APPLICATIONS OF FORMOL.

(*L'Odintologie,* Paris, Nov. 15th, 1909.)

Dr. Dessirier of *Lyon,* preconises Formol in the treatment of aphthae. The advantage of this treatment is to rapidly heal and to bring upon prompt cicatrization of aphthae.

This treatment consists of a local application with a peldget of cotton saturated with a 40 per cent solution of formol, taking care to previously dry the ulceration before applying the formol solution.

The first application will cause a sharp pain which will soon pass away and will not return. This anesthetic action of formol is quite remarkable, the movements of the lips, speech, and mastication will be performed with much more ease after the first treatment. Very few applications will effect a cure. In order to cover the unpleasant taste of formol, a few drops of spirits of menthol may be added to the solution.—(*Gaz. des Hopiteaux,* Sept. 21st, 1909.)

TO KEEP AMALGAM BRIGHT.

A simple solution of soda is better for cleansing fresh amalgam than alcohol. The amalgam does not darken afterward and retains a beautiful pure color.—(*Deutsch Zahnarztliche Zeitung.*)

DIE METAL.

Bismuth 48 parts, cadmium 13 parts, lead 19 parts, tin 20 parts. This easily fusible metal can be poured into wet plaster.—(*Zeitschrift Fur Zahnarztliche Orthopadie.*

METHOD OF HOLDING A CROWN FOR POLISHING.

Take a small stick of modeling composition, heat one end, dip it in shellac, and insert it into the open end of the crown, which has been previously filled with plaster mixed with salt. The salt accelerates the setting of the plaster, which will be completed by the heat produced by the polishing. Hold the whole under a cold water spigot and polish. To detach the crown, simply pass it slightly over a flame. The stick and plaster will come out, leaving the interior of the crown absolutely clean.—(*Bulletin du Syndicat des Chirurgiens Dentistes de France.*

SULPHURIC ACID TREATMENT OF PULPECTOMY.*

By R. Kern.

(*L'Art Deutaire,* Bordeaux, France, Nov., 1909.)

(*Revue Generale de l' Art Dentaire.*)

The good results which I have obtained in caries of the fourth degree with sulphuric acid treatment have induced me to present you with this article.

This therapeutic treatment is very simple for single-rooted teeth and for upper bicuspids; but, it offers some difficulties for molars especially those which are affected with distal cavities.

In cases of single-rooted teeth and bicuspids.—The precautions indicated by Dr. Siffre are to be carefully followed, *i. e.,* the mucous membrane should be protected from the drug. For this process, a copper sound is used, upon the end of which cotton has been twisted and dipped into the acid. It is then brought in contact with the pulp and with gentle pressure, it is forced into the root-canal; but this must take place very slowly and very gradually. Very little pain is usually caused by this treatment, and it generally takes place when the acid comes in contact with the pulp. If there is intense pain experienced when the sound penetrates the root-canal it is usually caused by a too small quantity of sulphuric acid, and in such cases, the sound should be, with the cotton, dipped in the acid and the operation continued. When the sound has reached the apex of the root, it should be rotated and withdrawn. This in most of cases will remove all contents of root-canal without any manifestation of pain from the patient.

In cases of molars.—I proceed in the following manner, after the mucous membrane surrounding the tooth has been protected. The cavity should be cleansed and the pulp denuded or exposed, then a peldget of cotton saturated with sulphuric acid is placed on the pulp and allowed to remain there for a few seconds and sometimes one minute according to the case. This will enable the operator to remove the pulp from the pulp-chamber, after which each root may be treated as above mentioned as if it were a single rooted-tooth.

FALSE TEETH CAUSE OF DEATH.

Remarkable Ledsham Case.

(*The British Journal of Dental Science,* London, Nov. 1st, 1909.)

An extraordinary death by misadventure was brought to light, when the Borough Coroner (Mr. Cecil Holden) held an inquiry into the death of Annie Ennis, of Brooklet Lodge, Ledsham.

Patrick James Ennis, a former bailiff and husband of the deceased, stated that his wife, who was a healthy woman, retired to rest on Sunday, the 26th. ult., at about 11:30 p. m. At about 2:30 in the morning, she awoke and aroused him, and he found her in a state of great agitation, gesticulating and evidently unable to speak. She pointed to her mouth, and on examination witness found that deceased's false teeth were sticking in her throat. He endeavored to extract them, but was unable to do so. He immediately went down stairs and telephoned to Dr. Nott, of Little Sutton. Dr. Nott arrived about 3:15, and after great difficulty succeeded in getting the teeth out.

Although she could not take any solid food afterwards, it was thought that she was progressing favorably until Friday 1st, inst. Then, she took a sudden turn for the worse, and by Dr. Nott's advice was removed to the Borough Hospital. Witness said that she never had removed the teeth, which she had worn for nine years, except for cleaning purposes, and when asked if she could account for the teeth getting into her throat she said she could not, unless while sleeping her head had been thrown too far back.

Dr. Nott deposed that about 2:45 on the morning in question, he received a telephone communication, and went prepared with the necessary instruments to extract the teeth. He made several attempts before the teeth were finally got out. Deceased vomited, and streaks of blood accompanied it. She was in great pain for two days, but on Wednesday was better and able to swallow some milk and eggs. On Friday, however, some obstruction appeared in the throat, and it subsequently took the form of an abcess. He saw that the change was of a serious nature, and he advised Mrs. Ennis's removal to the hospital.

Dr. Muir, senior house surgeon at the Borough Hospital, said that the deceased died from asphyxia, consequent on the abcess bursting and the matter escaping into the lungs. The removal of the

teeth from the throat reflected great credit on Dr. Nott, it being a considerable difficult piece of work.

The jury returned a verdict in accordance with the medical evidence.

ANESTHESIA OF THE DENTINE, PULP, AND MAXILLARY BY THE USE OF DISTAL INJECTIONS.

(*L'Odontologie,* Paris, Nov. 30th, 1909.)

This method of distal injections, says M. Polet, is made at the neck of the tooth, but it is not intradiploic, nor is it intragingival, and it should not be made at the apex; it is altogether different from other methods.

On another hand, this method is based on the following anatomical basis: The dental filament (nerve) enters the root distally.

There is between the root and the alveolus a ligament which is readily penetrated and saturated with a fluid, and this ligament will spread insensibility only towards the apex of the root. Maxillaries offer canals, pores, fissures which are easily penetrated by the needle and which will absorb the fluid.

Technic: A very strong syringe should be used for this purpose and the needles should be very thin. The injection is made distally with the exception of the third molars and upper cuspids. In cases where the anterior tooth has been extracted better results are obtained if the injection is made mesially. The needle should penetrate from one-half to one centimeter, (from 3 to 6-16 of an inch).

Mr. Polet says that the anesthesia follows the injection instantaneously in 60 per cent of the cases, although sometimes it is necessary to make a second injection on the opposite side and to wait a few moments.

The period of the anesthesia varies from five minutes to one hour. Generally the anesthesia will affect several teeth and sometimes the whole maxillary.

The author has used alypin, stovaine, cocaine, novocaine, all with the same satisfactory results.

Advantage of this method: Asepsis, rapidity, simplicity, and will be found to act also in the region of the lower molars.

The only objection is that it may cause a slight pericementitis which will soon pass away.

In the past few months, from 75 cases, the author has had 74 which were successful.—(*Revue Trimestrielle Belge de Stomatologie,* Sept., 1909.)

PYORRHEA ALVEOLARIS AS A CAUSE OF COLITIS.

(*The Dental Surgeon,* London, Nov. 27th, 1909.)

In the course of an article on "Seven Cases of Appendicostomy for Various Forms of Colitis," published in the *British Medical Journal,* of Oct. 30th, Mr. Frederick C. Wallis, F. R. C. S., Surgeon to Charring Cross Hospital, relates seven cases of appendicostomy which he regards as typical class of case in which the operation is of most benefit.

The following (Case 2) is of special interest from a dental point of view:

T., aged 45, was brought to me by Dr. Gregory, of Redcliffe Gardens, in July, 1908. The history was that she had been passing blood and mucous since Christmas. There was slight abdominal pain. She was losing flesh and had become anemic. On examining the mouth there was a marked condition of pyorrhea alveolaris.

A sigmoidoscopic examination was made under an anesthetic on July 2nd, 1908, and it was found that the upper rectum and the sigmoid as far as the sigmoidoscope would go were ulcerated in patches and generally congested.

The *Streptococcus longus* was cultivated from a swabbing taken from the discharge in the sigmoidoscope. This strongly suggested that the pyorrhea alveolaris was the cause of the colitis. The condition of the gums was immediately treated, and the patient was dieted and put on lacto-bacilline.

Operation.—Appendicostomy was performed on July 10th. The colon was washed through with several pints of sodium bicarbonate one dram to the pint, on the operation table, and for the succeeding seven days four pints of this solution were washed through twice a day. For the last five days there was no blood nor mucous in the washout.

The patient went into the country shortly afterwards, and the appendicostomy opening was allowed to close up. She has remained perfectly well ever since.

DEATH UNDER CHLOROFORM.

The West Cheschire Coroner (Mr. J. C. Bate) held an inquiry on Nov. 24th, 1909, in Wallasey, into the death of Lucy Craddock, age 28, a domestic servant, living apart from her husband—Arthur Capper, a New Brighton dentist, said deceased called upon him respecting teeth extraction. She did not seem surprised when he recommended her to have twenty-five teeth removed. He told her she would have to take chloroform and she willingly agreed. Dr. Alfred Johnston spoke to attending the Wallasey Cottage Hospital last Wednesday and administering the customary anesthetic. He examined the woman, and concluded that she was a fit subject for chloroform. She showed signs of collapse during the operation and despite all remedies, the woman succumbed. The *post-mortem* examination which was conducted by Dr. Napier proved that the right side of the heart was dilated, but it was impossible to diagnose this in life, as that side of the heart was turned inwards.

The jury found that the anesthetic had been administered skillfully, and that proper care had been taken, death resulting from misadventure.—(*The Dental Surgeon.*)

DENTAL DEATH UNDER CHLOROFORM.

A painful feeling was created in the Arbroath community, when it became known that a young woman, Mrs. Neave, had died on Sunday forenoon, Nov. 14th, while having some teeth extracted under chloroform. Mrs. Neave collapsed while under the anesthetic, and despite the efforts of her medical attendants passed away within half an hour. Mrs. Neave was 27 years of age.—(*Dental Surgeon.*)

ORIGINAL CONTRIBUTIONS

FIVE GREAT PROBLEMS IN DENTISTRY.

The Five Leading, Unsolved Problems in Dentistry are and have been—

THE AMALGAM FILLING,
PHOSPHATE CEMENTS,
CARIES AND EROSION,
OBSTINATE PYORRHOEA &
ORAL PROPHYLAXIS.

A Brief on the Specific Causes of Harmful Bulk Changes in Amalgam Fillings. Phosphate Cement Disintegration. Classifications, How to Make Cements, and Reduce or Remedy Putrefactive Stench in Bridge Cups. Durability of Thin Layers and Best Crown and Bridge Cement.

FORMULAS, METHODS OF MAKING, PHYSICS, CHEMISTRY AND LOGICAL RESULTS.

BY J. O. KELLER, D. D. S.

CLASSES, AMALGAM ALLOYS. They are known as Crucible Melt Alloys, Process Coated Granular Alloys and Partial Process Coated Molecular Alloys.

METHODS OF MAKING. Crucible Melt Alloys are made by melting the metals, tin and silver, or tin, silver, copper and zinc and other metals together in a crucible, one heat, or by first melting the tin, then adding the other metals gradually until all are melted, and lastly the zinc, or the tin may be melted in one crucible and the high fusion metals in another crucible, then intermix by pouring together and repouring. The method of making coated alloys will be given in a subsequent paper.

LOGICAL SEQUENCES. The specific causes of shrinkage, expansion, protruding, spheroiding, crevicing and sloughing of margins in Amalgam Fillings and of the disintegration of phosphate cements

in the oral cavity must be known to enable the physicist to reduce or remedy such harmful conditions. In general physics, chemistry and molecular constitution, amalgam and cement masses are fundamentally the same. He who has gained a reasoning understanding of the physics and chemistry of one can readily master the other.

AMALGAM ALLOYS AND AMALGAMS. Formula and plan of construction (method of making) determine the physics and molecular constitution of the alloy, its consequent chemistry and mercury in Amalgam Fillings and molecular constitution of the amalgam. Method of making is an important factor in determining structure.

CLASSIFICATION, CRUCIBLE MELT ALLOYS AND AMALGAMS. All Crucible Melt Alloys, according to the melting or dissolving heat and slow or quick cooling and Amalgam Fillings made with them, have a varying molecular physical constitution, different sized molecules of silver (classification), large, small or medium, and consequent varying harmful shrinkage, expansion, spheroiding, crevicing and sloughing of margins. High heat and too quick cooling cause small silver molecules, resulting in quick setting, expansion and crevicing. Slow cooling causes large silver molecules, slow setting and tendency to shrinkage. Medium cooling gives medium sized silver molecules, medium setting and least shrinkage or expansion and crevicing. A classified physics and chemistry with mercury determines these movements. The molecular constitution of the alloy determines the molecular constitution in Amalgam Fillings. This classification determines the specific causes of the various harmful, marginal and structural changes, resulting from wrong methods of making, and suggests or enables remedial conditions.

REMEDY, LOGICAL OR COMMON SENSE CONSTRUCTION. The foregoing harmful bulk change and marginal conditions in Amalgam Fillings can only be remedied by inserting Amalgam Fillings made with Process Coated Granular Alloy, or materially improve by using the Partial Process Coated Molecular Alloy. The granules and molecules must be so hard and tough that under the conditions in the Amalgam Filling mercury will neither eat nor dissolve nor penetrate them, but surface crystalize them together into a hard amalgam mass. They must be very small, so as to make a plastic working amalgam, not small enough to form in crystals, but large enough to concrete together by surface chemical affinity. They

must contain only enough gold, tin and zinc coating which, with the mercury in the Amalgam Filling, will be sufficient to fill in between the inter-granular or inter-molecular spaces.

Mercury has a high physical affinity for tin, and ready chemical action on silver. These two forces war with each other in the Amalgam Filling. As soon as they become equalized, the amalgam mass becomes stable, bulk changes cease. Such granular alloys require only three-fourths of their own weight of mercury; that is, 60 grs. of the alloy will require only 45 grs. of mercury in the Amalgam Filling; whereas Crucible Melt Alloys require their own weight and more of mercury. The secret or so-called Patent Alloy makers advertise 5 parts of Alloy to 7 parts of mercury. Some of them as high as 7½ to 8 parts. These alloys demand 80 to 90 grs. of mercury to each 60 grs. of alloy. Amalgam Fillings made with the Coated Granular Alloys aforementioned require but little more than half as much mercury. It gives more permanent amalgam structure, stable strength. Amalgam Fillings made with Crucible Alloys lose about two-thirds of their strength within three years from time of insertion; hence, almost universal breaking down of margins in time.

The method of making Coated Granular Amalgam Alloys with physics, chemistry and logical results will be given in a subsequent paper.

CLASSES, PHOSPHATE CEMENTS. They may be known as Soda Phosphates and Aluminum Phosphates. Other phosphates have been used, but so far the only successful reagents and neutralizers have been Soda and Aluminum metals, transformed by chemical reaction into the cement liquid. It is but recently that Aluminum has been successfully used because of the difficulty of transforming that metal into the tri-basic Aluminum Phosphate in the cement liquid. Aluminum Phosphate is the most successful reagent, because of its chemical stability and less tendency to crystallization than Soda Phosphate. It makes the cement mass at least 50% less soluble, same classification of powder; that is, if a Soda Phosphate Cement, with a given powder will hold a bridge five years, an Aluminum Phosphate will hold it seven and one-half years, same conditions.

METHOD OF MAKING PHOSPHATE CEMENTS. The different methods of making Phosphate Cements can be more clearly comprehended in their physics, chemistry and logical results in cement

masses under bridge and crown cups, inlays and cement fillings by studying the physics and chemistry, alone and combined, of cement powders and liquids, than any other way; hence the following classifications:

CLASSIFICATION, CEMENT POWDERS. Zinc Oxids are used almost exclusively for Phosphate Cement Powders. Other oxids may be used in small percentages, such as aluminum, lime, magnesia, silicates, white clay, etc., but so far Zinc Oxids alone, properly calcined, give best results.

ZINC OXIDS result from the chemical union of the elementary metal, zinc and oxygen gas. One atom of zinc unites with one atom of oxygen and forms one molecule of Zinc Oxid. Millions of Zinc Oxid molecules cluster together, in feeble physical adhesion, and constitute the white powders of Zinc Oxids for sale in drug shops. These molecules are very small. A cubic inch space will hold hundreds of billions of them. They are invisible under the lens of the highest power microscope, but in clusters they become visible to the naked eye.

ZINC OXIDS FOR CEMENTS are of three classes, as follows: High Fusion, Low Fusion and Medium Fusion. Subdivisions, No Grit, Near-Grit, one-third Grit, one-half Grit, two-thirds Grit and All Grit.

ALL GRIT ZINC OXID POWDERS, High Fusion, are calcined at 2800 deg., ten days in furnace, near melting point of cast iron, full vitrification, or All Grit, vitrified, hard, granular, glass-like. The most perfect calcination causes a diamond-like mass, so hard as to cut glass. Spec. Grav. ranges from 3 to 4. When milled, All Grit Powder pours like fine sand.

NO GRIT ZINC OXID POWDERS, Low Fusion, are calcined at about 2000 deg., near the melting point of gold and copper, forty-eight hours in furnace. At such heat, Zinc Oxid Molecules do not fuse together in solid mass. They weld together to a chalky-like nature; but when milled, they resume a cluster molecular condition and are known as the NO GRIT, or molecular Zinc Oxids of the secret or so-called Cements. NO GRIT POWDERS are soft, light, very fine, flour-like and pour in flaky masses.

NEAR-GRIT ZINC OXID POWDERS, Low Medium Fusion, are calcined at about 2300 deg., ten days in furnace, so as to cause

a physical condition approaching NEAR-GRIT, or about Grit. Spec. Grav., about 2⅜. Higher heat causes Grit to form; hence—

ONE-THIRD GRIT ZINC OXID POWDERS, Medium Fusion, are made by calcining at 2400 deg., ten days in furnace, resulting in a mass one-third of which is Grit and two-thirds Near-Grit. Spec. Grav., about 2⅝. Or one-third Grit may be made by mixing 1 part ALL GRIT with two parts NEAR-GRIT, one-half GRIT by mixing equal parts ALL GRIT and NEAR-GRIT, and so on, two-thirds GRIT and three-quarters GRIT, or any other ratio.

PHYSICS, CHEMISTRY AND LOGIC. The atoms of the ultimate molecules of Zinc Oxid Powder are held together by chemism only. In cluster molecules, as bought in drug shops, they are held together in physical union as powder particles. In this condition they are not fit for cement powder, because of too active chemical tendencies. By calcination at high heat, these ultimate molecules may be fused together into compound molecules. This process may be carried so far as to weld many of the ultimate molecules together in masses of a few grains to pounds in weight. The force which holds them together by calcination is entirely physical and makes the mass granite, or stone-like. They may be reduced in a stamp machine, then ground into fine grit or milled into flour-like powder, resulting in varying sized granules and powder particles, suitable for making Phosphate Cements. The more dense and granite-like, the lesser the liquid required, the stronger and less soluble the cement mass.

CLASSIFICATION PHOSPHATE CEMENT LIQUIDS. Oxyphosphate Cement Liquids may be divided into two classes and three varieties, as follows:

CLASSES. They are divided into two general classes, known as Soda Phosphate and Aluminum Phosphate. Other phosphates have been used wholly or as associates, such as phosphates of lime, magnesia, zinc, lead, etc., but Soda and Aluminum Phosphates have been the most successful reagents and neutralizers; hence the above classification.

VARIETIES AND NOMENCLATURE. Several varieties of Phosphoric Acid may be derived from phosphoric oxid, as follows:

FIRST, Single Base, Prima-Basic, Mono-Basic, Metaphosphoric and glacial phosphoric, are equivalent names.

SECOND, Double base, bi-basic, pyro-phosphoric and tetra-basic are equivalent names for the dual or double base variety.

THIRD, Triple base, tri-basic and ortho-phosphoric are equivalent names for the triple base phosphoric acid.

PHOSPHORIC OXID consists of two atoms of phosphorus and five atoms of oxygen, making one molecule of phosphoric oxid. A single molecule of water, chemically united with one molecule of phosphoric oxid, makes one molecule of single base phosphoric acid. The single molecule of water determines its nomenclature. Two molecules of water united with one molecule of the oxid gives the names, double base or bi-basic. In like manner, three molecules of water united with a single molecule of oxid gives the triple or tri-basic nomenclature.

For detail as to classification, Phosphoric Acid combination and its phosphate equations, in making cement liquids and molecular conditions in cement masses, the student is referred to Keller's Classic Researches in Phosphate Cements. Cement Liquids, when first made, are most always mono-basic, which should be transformed or transposed into the bi-basic variety, and from the bi-basic into the tri-basic series. Because of the changeable characteristics of the mono-basic and bi-basic Acids, the tri-basic phosphoric acid and its phosphates only should be used in making Phosphate Cement Liquids.

PHYSICS, CHEMISTRY AND LOGIC. Cement masses partake of the physical and chemical nature of their components. Hard, granular, heavy, condensed Grit Zinc Oxid particles, with Aluminum Phosphate Liquid, make strong, hard, durable Cements, slow to WASH OUT. Cements made with soft, flaky, light, No Grit Zinc Oxid Powders, with Soda Phosphate Liquids, are much more liable to disintegration, granulation and absorption of saliva, with organic matter. Microbic putrefaction in Bridge Cups and offensive stench follow. Soda Phosphates are much more liable to chemical solution in the salivary secretions than Aluminum Phosphates. The latter with higher grade Zinc Oxids largely reduce, or with care in use obviate, organic absorption and putrescence.

CLASSIFICATION. Secret or So-called Patent Cement Powders and Liquids.

POWDERS, NO GRIT—Equivalents, Abrahams, Ames, Brittons, Columbia, Fellowship, Petroid, Silicat.

NEAR-GRIT—Equivalent, Harvard.

ONE-THIRD GRIT—Equivalent, Justi's.

LIQUIDS are all Soda Phosphates, ranging from 50 to 68%. Fellowship contains 50%, Ames 55, Petroid 59, Abrahams 57, Harvard 65, Justi's 68% Soda Phosphate.

All Cement Powders and Liquids, all manufacturers, are included in these classifications. No matter what cement you use, its Zinc Oxid is either No Grit, Near-Grit, one-third Grit, All Grit or some grade between. Its liquid is Soda Phosphate or Aluminum Phosphate, either alone or associated with one or more other phosphates, as the maker may devise. Soda and Aluminum, however, are the main controlling reagents. All Powders and Liquids are both intermixable and inter-usable.

Cement masses are made by mixing Zinc Oxid Powders with Phosphate Liquids in various proportions to meet the requirements of dental office practice. They are used mostly for setting Crowns, Bridges and Inlays. Because of the extreme solubility of the Soda Phosphate Cements, they are used but little for Fillings. Under bridges and inlays they are more durable and hold this class of artificial dentures all the way from a few months to a few years and up to 25 years or more. The average life of Crown and Bridge Work set with Soda Phosphate Cements, considering all kinds of good and bad dentistry and conditions, is about 5½ years.

SETTING PROPERTIES. The setting properties of Phosphate Cements are regulated by both the powder and liquid. A Cement mass that would be quick setting, made with a Low Fusion Powder, No Grit, and a given liquid, would be slower setting with a Near-Grit Powder, still slower with a one-third Grit and very slow with an All Grit Powder. The Liquids are made quick setting by using small percentages of reagent Phosphates. Soda Phosphates may range from 40 to 70% in Soda Phosphate Liquids. A 70% Soda Phosphate Liquid would be medium setting with a very Low Fusion Powder. This Powder is very quick setting in character because of minute molecular division, and All Grit Powder is slow setting in nature because of its density and resistance to crystalization. In physical characteristics it will require many such molecular Zinc Oxid molecules, all the way from 50 to 100, if condensed by low heat calcination, to make a single granule of All Grit Zinc Oxid. It is

this minute state of division which causes the Low Fusion Powder particles to set quickly and to form into body crystaline structure.

LOGICAL RESULTS. The objections to Phosphate Cements are their lack of high crushing resistance, tendencies to disintegrate in the salivary secretions and liability to granulate and disintegrate in Crown and Bridge Cups. The Cement in one section or side of the cup may be secure, while the other side has become granular, porous or dissolved. Capillary suction causes an infiltration of saliva with organic matter. It may become a breeding place for deadly microbic culture. Putrefaction follows. When the cup is removed or comes loose, an unbearable stench greets the olfactories. One part of the cup may be holding the cement for several years, while another part may be alive with bacteria, resulting from the decay of animal and vegetable matter.

NOTORIOUS FOR SOLUBILITY. The extreme solubility of Phosphate Cements heretofore in use is a result of the soda in them, and a large percentage of liquid in the cement mass, because of the demands made for large liquid percentages by the molecular zinc oxids—that is, fine, flaky, flour-like powders.

BRIEF. CEMENTS ARE DISSOLVED BY THE NEUTRAL SALT, ACID, ALKALINE OR ACRID AGENCIES IN THE SALIVA. The saliva contains such acids as Lactic, Muriatic, Sulphuric, Acetic, Oxalic, Phosphoric and Malic; such alkalies as Potassium, Potash, Lime, Soda, Magnesia and Chlorides; hence, such Neutral Salts as Lactates, Muriates, Sulphates and Phosphates of Potassium, Potash, Lime, Soda, Magnesia, etc., such acrid agencies as sulpho-cyanide and sulphuretted hydrogen; hence, cements, the same as human teeth, are disintegrated or rotted in the mouth by direct chemical action, or by chemical reaction, or by double chemical reaction, either alone or all combined, with these Neutral Salt, Acid, Alkaline and Acrid agencies.

The foregoing is a very condensed brief of the specific causes which rot Phosphate Cements in the Oral Secretions. A subsequent paper will give full details as to such chemical decompositions.

Noted bacteriologists have come to the logical conclusion that putrefactive stench in bridge cups is a result of bacterial cultures. When these art dentures are removed the smell is often so rank as to be nauseating. The writer can do no better than to quote Dr. F. B.

Noyes, who is so disappointed in his experience with such offensive removals that he is tempted to "throw his microscope into the Chicago river." He says, in Transactions, Illinois State Dental Society, 43rd Annual Meeting, May 17th, 1907, page 200, as follows:

"I have within the last half hour, since listening to this paper and discussion, been tempted when I go back to Chicago, to take my microscope and scientific apparatus and throw them into the Chicago river, for it seems to have destroyed my faith in things, to which other men pin their faith, and to give me faith in things which other men doubt.

"I cannot understand the faith of the dental profession in Cements. To me they are the most unreliable thing that I know anything about. * * * I don't see how any man who has ever removed a crown or bridge and cut the cement out from under it and has had delightful sensation to his olfactory nerves can believe that cement hermetically seals anything, for we find that this cement is permeated by organic matter."

To fully explain the causes of decomposition of Phosphate Cements in Bridge Cups and infiltration of organic matter, putrefaction and stench, the writer can do no better than to quote from Keller's "SPECIFIC CAUSES OF ORAL BACTERIAL CULTURES." A noted bacteriologist says that "organic disintegration in the oral cavity and accompanying putrefactive stench indicate bacterial cultures. Disintegrating Phosphate Cement fillings in bridge cups and around creviced gold amalgam and other fillings may be breeding places for deadly microbes, containing tubercule bacilli, or the dyphtheric and pneumonic germs. The stench is logical and conclusive proof of micro-organic culture.

"Phosphate cements made with Molecular Zinc Oxids, flour-fine, flaky-like powders and soda phosphate liquids are the chief causes of disintegration; thereby affording lodgement places for such culture, Cements made with such oxids and liquids are outrageous crystallizers and notorious for disintegration and solubility."

"Phosphate cements made with Grit Zinc Oxids and non-sodium phosphate, cement liquid (aluminum) or other non-soda phosphate is the only way to reduce or remedy. Granular Grit Zinc Oxid particles with non-soda liquids do not form in crystals. They surface

crystallize together, do not body crystallize, hence reduce or obviate disintegration, bacterial cultures and stench in bridge cups. The higher the grade or specific gravity of the Zinc Oxid, the better the results.

"Crystallization, granulation, porosity, absorption of saliva with organic matter, bacterial cultures and putrefactive stench will result just in proportion as the powders and liquids recede from the granular Grit Zinc Oxids and non-soda phosphate liquids, because such physical, chemical and disintegrated conditions are caused by molecular Zinc Oxids and Soda Phosphate liquids, and always will result so long as they are used in the oral cavity.

SOLUBLE TENDENCIES. One pound of Soda Phosphate will dissolve in seven fluid ounces of water, while one pound of aluminum phosphate will require over 100 pounds of water to dissolve it. These chemical tendencies are largely carried into the cement mass. Phosphoric acid will dissolve in one-seventh part of water—that is, seven pounds of phosphoric acid will be held in aqueous solution with one pound of water.

Not only the physics of the Cement Powder, but the kind and quantity of liquid in the cement mass determines the tendency to disintegration in the saliva. If a bridge cup will be held in place five years, with 30% of Soda Phosphate in the cement which retains it, a cement made with a powder requiring half as much liquid, hence but 15% of soda phosphate in it, will hold the same art work ten years or longer, same mouth conditions.

Cements made with a Soda Phosphate Liquid are much more soluble than Aluminum Phosphates, because of the changeable characteristics of sodium compounds. Sodium enters into more chemical structures and crystalline compounds than any other known alkali, except, perhaps, potassium. It is the chief element in sodium chloride, common crystal salt. It is liable to ready attack by lactic, phosphoric, sulphuric and other strong acids in the saliva, either alone or combined in their Neutral Salts. By chemical reaction soda phosphate in the cement would be extremely liable to granulation and disintegration by potassium lactate, potassium sulphate, potassium muriate, potassium phosphate or any other potassium salt. The potassium will disengage the phosphoric acid in the cement mass, while the lactic or other acid would chemically combine with the soda and form

lactate of soda, or other salts, according to acid concerned. The agencies which maintain the integrity of the cement structure are disengaged. The cement mass disintegrates and washes out. Salivary absorption and putrefaction follow.

Aluminum Phosphate Cements are less soluble because the metal aluminum enters with difficulty into various chemical relations. It is a bad crystallizer, and with difficulty is transformed from the metallic state into Aluminum Phosphate by chemical reaction. When transformed it is more stable in its combination and not so liable to crystallization and change as Soda Phosphate; hence Aluminum Phosphate Liquids have little or no humid susceptibility like Soda Phosphates. The latter sets and acts indifferently in damp, hot, cold and sultry atmospheric conditions. These absorbant and deliquescent properties are the causes of the changeable and peculiar working properties of Soda Phosphate Liquids.

BEST CROWN AND BRIDGE CEMENTS. Phosphate Cements are used more to set Crowns and Bridges than for all other purposes; hence a cement that will hold such art denture longest possible and not be liable to microbic stench in their cups will be a fundamental betterment. Held with Soda Phosphate Cements now in use, they most all come loose within one to ten years. Some reach a life of fifteen years. Now and then a patriarch bridge of twenty-five years can be seen.

ONE-THIRD GRIT CEMENT. BEST FOR CROWNS AND BRIDGES. Nothing Secret. No Patent. Anybody at liberty to make it. It is made by mixing a non-sodium phosphate liquid with the highest grade of Zinc Oxid which can be used, and enable an emplacement of such dentures. The higher the grade of Grit Zinc Oxid, the lesser the liquid, the better the cement. As before shown in this paper, there are four distinct grades of Zinc Oxids, namely, No Grit, Near-Grit, one-third Grit and All Grit. An All Grit requires such small percentages of liquid that it will not readily flow; hence would not be practicable, except by long experience. It demands less than one-third of its own weight in liquid.

A one-third Grit Powder, composed of one part Grit and two parts Near-Grit Powder, is about as high grade Zinc Oxid as can be readily used for Bridge Work. It demands about one-half its own weight of liquid. Mixed as thick as can be used with Aluminum

liquid, it will hold crowns and bridges much longer than Soda Phosphate cements made with lower grade zinc oxids, for reasons aforementioned in this paper. The Grit Zinc Oxid Cements are not as easy working as the Soda Phosphate Cements, because they require less liquid. Longer life, less liability to wash out and reduced or obviated microbic stench must be gained by working for such an end by using more difficult working cements. If a dentist insists upon using an easy working cement, one that works to suit him, he does so at the expense of durability and putrefactive stench. He has trained himself to consider easy working properties, rather than quality, stability and durability. Liquid percentages in cement masses heretofore have not received the attention which they deserve. Few have estimated the importance of decreased phosphate liquid percentages in cement masses. The larger the percentage of liquid, the more liable to attack by associate potassium compounds in the salivary secretions. Low grade Zinc Oxid Powders requires from 35 to 50 grs. of Liquid, Crown and Bridge flow.

Strange as it may seem, phosphate cements rot the same as teeth. It would be as appropriate to say caries in the cement filling, or in bridge cups, as caries in teeth. The same chemical agencies destroy the enamel, dentin, cementum, alveolar process and phosphate cements. They are all phosphate compounds. Phosphoric acid is the chief combining agency. The main difference is that the former are lime phosphate compounds, and cements are zinc phosphates. The same phosphoric acid, however, holds the units of all in solid mass. If phosphate cements are more liable to decomposition than tooth-bone, it is because they contain more phosphoric acid in chemical combination than said bone. Zinc, especially calcined zinc oxid, is much more stable in physical and chemical structure than lime, which constitutes the great body of human teeth. The Zinc element is much more stable and less liable to enter into varying chemical structures. Lime is abundant everywhere, at least in small percentages. Zinc is obtained only by mining processes. Hence it can be readily seen that the calcium phosphate of tooth structure, because of its compact density, cell to cell and rod to rod, with a small percentage of phosphoric acid, is less liable to chemical decomposition than zinc phosphate cements, because the latter often demand their own weight or more of the poisonous soluble phosphoric liquid.

DENTISTS SHOULD KNOW. There is as much reason that the dentists should know the formula, physics and chemistry of cements as the physician should the formula and medicinal qualities of the various pharmaceutical preparations. Indeed, pharmacy means non-secrecy. Names, both in dentistry and medicine, should indicate as near as possible the physics, chemistry and properties. For, e. g., the trademark name "Churchill's Hypophosphites of Lime, Soda and Magnesia" tells who is maker or inventor, its component parts and chemistry. The physician has learned the medicinal properties in the dispensatory; hence he prescribed the remedy intelligently. He may not understand the chemical process of manufacturing the preparation, yet he may know better how to give the remedy to patients than the manufacturing chemist.

The trademark name 1/3 GRIT indicates the physics and chemistry of cement powder. Aluminum Phosphate Liquid means that phosphoric acid and water in chemical equivalent proportions are charged with the metal aluminum, transformed into phosphate as a chief neutralizer, to give a proper setting. Heretofore no cement has been put on the market, in all dental history, which has a classification, nor indicating a non-secret trademark name of powder and liquid; hence dentists, even the ablest of them, are in ignorance of the physics and chemistry of phosphate cement preparations. The best dentist may be using the poorest cement and think he is using the best.

If the cement maker gives formula, physics and chemistry, dentists can experiment intelligently and be able to tell what cement is best for specific uses. The result is that the able practitioner may be using the poorest cement and think he is using the best. His good dentistry, instead of the cement, gives good results. Good dentistry with the poorest cement is much better than bad dentistry with the best cement.

The writer claims to have an ethical right in this paper to say that 1/3 GRIT CEMENT is best for Crowns and Bridges, because he knows its formulas, physics, methods of making and chemistry, and he knows the formula, physics and chemistry of the secret or so-called "Patent Cements" by chemical analyses. He has analyzed all their powders and liquids. The names of the 1/3 GRIT CEMENT powders and liquid indicate their formulas, physics and chemistry. Ce-

ment masses made with them have component parts accordingly. Therefore, he is at honorable liberty to say that 1/3 GRIT CEMENT surpasses all others for Crown and Bridge Work. When another maker invents a cement with powder and liquid having superior physics and chemistry as shown by formulas, he will then have a moral right to say that his cement is best and beats all others, and not before.

When a dentist has learned by formula, physics and chemistry that a non-secret cement which he uses, and which anyone has a right to compound, has good and surpassing properties, he has an ethical right to advertise it by talking it publicly and privately and writing papers in its behalf for dental magazines, the same as physicians do for pharmacy in medical journals. For these reasons the following list of honorable dentists in good practice, who have used 1/3 GRIT CEMENT ranging from three to six years, lend their names in favor of non-secret dental pharmacy, and say of it as follows:

Dr. J. E. Low, Champlain Bldg., Chicago. Inventor of Crown and Bridge Work. Used 1/3 GRIT CEMENT about six years. Make close fits. Take pains to mix cement as thick as possible to use it. Two bridges loose and six crowns removed and loose. Did not notice any offensive odor.

Dr. J. Finley Kettles, and associate dentists, Roseland, Chicago. Used 1/3 GRIT CEMENT about four years. Set over 1200 art dentures with it. Six only removed and come loose. Two had slight stench and four had none.

Dr. L. Funk, Great Northern Bldg., Chicago. Used 1/3 GRIT CEMENT over five years, but did not notice as to stench in bridges which came off or removed for cause. Have had fewer mishaps than with any other cement.

Dr. J. A. Vasumpaur, 1562 West 22nd St. Used 1/3 GRIT CEMENT over three years. Use it because have less trouble with it than any other cement. Took no particular pains to notice as to offensive smell in Crown and Bridge Cups which came off. Not much, else I would have noticed it. My associate dentists use another cement. Memorandum of cement used in each case.

Dr. A. C. Baur, Logan Square, Chicago. Used 1/3 GRIT CEMENT 4½ years. Less than a dozen art dentures came off, both in the way of accidents and removals. Noticed an absence or reduced

odor. Uses it because he has better success than with any other cement.

Dr. H. E. Philips, 5447 Ashland Ave., Chicago. Used 1/3 GRIT CEMENT about three years. Two bridges and six crowns off; both accident and cause. Use the cement because it gives least bother. Failed to notice as to putrefaction and offensive smell. At first had difficulty in using it, but soon learned how.

STABILITY THIN CEMENT LAYERS. Able dental practitioners say that thin layers of cement, about one 100th of an inch in thickness, or less, under close fitting inlays, are not liable to such rapid disintegration as bulky cement masses in cement fillings, or thick layers under shell crowns and bridge cups.

It is said that thin layers of cement under inlays will hold such structures, in many cases, five to ten to fifteen years or more and not wash out. The disintegration space will not extend inward to a greater depth than the thickness of the thin layer, which fills up with some sort of calculus matter from the saliva, and which hinders further ingress of the acid and alkaline solvents.

It is the purpose of this paper to give the specific causes of the durability of thin layers of phosphate cements. Such research results can be gained only by reasoning from cause to effect, by analogy, and between the physical and chemical constitution of the cement, tooth structure and art work.

PHOSPHATE CEMENTS. Their General Composition. All Phosphate Cement powders are Zinc Oxids, save, now and then, small percentages of other Oxids, not materially changing the physical and chemical characteristics. The liquids have phosphoric acid and water for basic constituents. They are charged with Soda, Aluminum or other neutralizers to regulate the setting; hence contain free phosphoric acid, 10 to 30%, phosphates and water free and combined; therefore cement masses in all cases, are double, triple or quadruple phosphates of Soda and Zinc, Aluminum and Zinc, or aluminum, zinc and soda.

Forty grains of powder for an inlay mix will require from 60 to 80 grains of liquid. A cement filling in a tooth cavity made from such large liquid percentage would wash out in any mouth within a few weeks or months, because of the active chemical affinity of the over acid liquid for Neutral Salt or Neutral Salt alkaline saliva.

Thin layers of cement under dental art structures, aforementioned, are in contact, on one side with porcelain, gold, amalgam or other metal, and on the other side with tooth-bone. Consider the general physics and chemistry of said tooth-bone, dental art work and cement between them. In order to set such close fitting work, such as cast gold inlays, say, to one 1000th of an inch or less, the cement mass must be mixed very thin, so thin as to flow readily and permit placement. A thick mass of cement would hinder the operator to press his work home.

COMPARATIVE SOLUBILITIES. Thick mixes of Soda Phosphate Cement as fillings in tooth cavities will disintegrate within a few months or a year or two. Grit Zinc Oxids, 40 grains, with Aluminum liquid 8 to 10 grains, thick, putty-like mix, may last several years and be practically insoluble. Either of the above, thin mixes, such as used to set inlay work, would last but a few weeks as fillings. Such thin layers, adjacent to tooth-bone under inlays, may last five years, ten to fifteen or more, in many cases. It is the purpose of this paper to give the specific causes of such durability.

In order to gain such durability under inlay work and give solidity to the inlay embedement, some disposal must be made of the excess acid liquid. Unless there is some surrounding physical and chemical attraction for the said acid, the inlay will soon come loose, because of the absence of frictional wedge cleavage. The inlay material, that is, the body of the inlay itself, any kind of metal or porcelain, has neither physical nor chemical attraction for the said acid liquid; hence the tooth structure only can satisfy the surplus, as follows:

TOOTH-BONE, ENAMEL AND DENTINE. THEIR CHEMICAL COMPOSITION.

ENAMEL.		DENTINE.	
Calcium phosphate	85.3	Calcium phosphate	62.0
Calcium carbonate	8.0	Calcium carbonate	5.5
Calcium fluoride	3.2	Calcium fluoride	2.0
Magnesium phosphate	1.5	Magnesium phosphate	1.0
Sodium salts	1.0	Sodium salts	1.0
Water and animal matter	1.0	Gelatin and water	28.5
	100.0		100.0

ORIGINAL RESEARCHES. Tooth-bone and phosphate cements in contact. The foregoing formulas for tooth-bone show that both the enamel and dentine contain over 85% of the phosphate, 8% carbonate of lime, the dentine 62% phosphate and over 5½% of carbonate. As gelatin and water make up 28% of the dentine, the inorganic matter of the dentine constitutes 72 parts. Five and one-half parts is almost exactly 9% of 72 parts; therefore about 9% of the earthy matter of the dentine is carbonate of lime.

Phos. acid has a higher affinity for the calcium of carbonate than its carbonic acid; hence the free phosphoric acid will combine with the lime of the tooth, form a new compound, known as calcium phosphate and liberate the carbonic acid. During this chemical reaction globulettes of carbonic acid, bubble-like, will cling to the outside of the tooth structure.

As many as 500 of these globulettes may be seen on a single tooth. The free phosphoric acid in the liquid extracts the lime in the carbonate, appearing as a white substance on the outside. After several days of digestion the tooth may be removed. It will be found to have lost weight to the extent of one to two and a half grains.

REASON AND SOUND LOGIC. Free phosphoric acid of the cement liquid eats tooth structure. These chemical relations show that it decomposes the calcium carbonate both of the dentine and of the enamel. The loss of weight in the tooth, the escape of carbonic acid, the extraction of a white substance, kindred to lime in appearance, indicates lime decomposition.

The enamel has a smooth, glossy appearance. After several days in phosphoric acid liquid, the gloss largely disappears, the tooth surface becomes more opaque and roughened, dentine shows decided disintegration on its surface, resulting from the chemical action of the phosphoric acid upon the phosphates and carbonates.

Phosphate cements are mixed very thin, so as to enable the setting of close fitting inlays. The ordinary sized inlay will require less than a grain of the cement mass in the setting. Generally this cement mass will consist of one part of powder to one and one-half parts liquid. The large liquid percentage gives consequent large percentages of free phosphoric acid. The metal or porcelain structure of the inlay will not combine with any of the free phosphoric acid in the

liquid; hence the tooth structure will neutralize and help thicken and harden the excess liquid and free phosporic acid, as follows:

CHEMICAL ACTION AND PHYSICAL ABSORPTION. The free phosphoric acid in the thin layer of cement liquid under the inlay attacks the carbonate of lime, is taken up by and liberates carbonic acid, thereby neutralizing said acid, extracting lime and making it a part of and a thickening of the thin layer of cement. The enamel and dentine are made somewhat porous by said extraction, hence absorb some of the phosphates of the cement liquid, thereby further thickening the liquid cement under the inlay.

Although calcium phosphate of the tooth is in chemically equivalent proportions, and definitely satisfied and arranged according to nature's laws, same as the phosphate in the cement liquid should be, yet these phosphates, in consequence of being kindred in chemical composition, have a physical attraction for each other.

The phosphate tooth structure absorbs the phosphates of the cement mass, thickens and makes the inlay setting more durable.

The foregoing are the chemical and physical reasons for the durability of thin layers of cement under inlays and other dental art work. If the cement masses are very bulky, the tooth-bone will not dispose of the excess quantity of free phosphoric acid and the phosphates in same; hence they are less durable and more liable to attack and wash out by the saliva.

These physical and chemical reasons show why the dentists fail so frequently in setting dental art work by the use of large masses of cement, depending more upon the cement to hold their work than close fitting art dentures.

These reasons also show why the skillful dentist may be successful with the poorest cement, and think he is using the best. Close fitting work, assisted by absorption of the excess acid in the tooth structure, makes success.

The foregoing physical and chemical reasons further show that it is wrong to continue the habit of using cavity linings under cements, such as chlora percha, sandarac, shellac, amber and other varnishes, save, perhaps, immediately over sensitive dental pulps, for the reason that said linings will hinder a neutralizing and a thickening of thin layers of cement under close fitting dental art work.

EVIDENCES OF CHEMICAL ACTION AND REACTION. Dessicate a human tooth, then pulverize to a fine powder. Spatulate with cement liquid. The puff up, or effervescence caused by the escape of the carbonic acid shows the chemical action and reaction of the free phosphoric acid on the calcium carbonate. The mixture will not harden, or but slowly, because the powder contains about 90% chemically satisfied calcium phosphate.

WHAT'S THE INFERENCE?

I wedged my way into the crowd
Upon the elevated station,
Some humming, others talking loud,
When lo! the name of Carrie Nation
Was spoken by a Madam "Dry"
Who lauded her for more than bravery,
While at my left I heard a "guy"
Use expletives that smacked of knavery.

The evening air was damp and chill,
So I moved on a few more feet
Lest I should feel from standing still,
My haemoglobin lose heat.
Divers topics were discussed,
One was this awful day of graft;
Another was the reign of trusts
That rule high-handed spite of Taft.

The train was several minutes late,
"Old Congress Street" its destination,
So waiting sometimes is our fate,
Hence, this rythmic detonation.
"Say Maud, the gray-hound sign
Is where the cars stop to a dot—
The gates I mean will be in line,
And open at that very spot."

"We'll have to wedge a few feet more;
My! Did you ever? What a crowd!
There, stop! We'll be right at the door
Say, who was that just turned and bow'd?"
The train pulled in; the air brake brought
The cars right quickly to a stand,
But not where Maud and Mame had tho't
So they ripped out an —— "O my land!"

L'ENVOI.

The stars that deck the vault profound,
In emblematic nucleant throng,
Whisper a semblance rarely found,
The utterance of a statelier song:
A tho't that brightens to the last
In memory of the ODONTOBLAST.

Don't tell nobody. Ahem!

J. D. ROBERTSON.

An interesting dental operation has been performed in the zoological garden in New York on Mogul, a young rhinocerous. Poor Mogul suffered from a decayed tooth. Filling was declared by the surgeon absolutely necessary, and it was decided that Mogul should be put under chloroform. Inhalation was altogether a failure, for the more chloroform it was tried to administer the livelier Mogul became. Then the assistants bound him with cords, and after a gagging process, the tooth was filled, and Mogul may now be described as being as "happy as a sandboy."—*The Dental Record,* London, August, 1908.

ABSTRACTS AND SELECTIONS.

A REPLY.

To the Editor of The Dental Digest:

I accept the challenge of Dr. Spence, and in a few words venture to reply.

This matter of plaster expansion has to my mind been largely overdrawn, and lots of ink wasted in its behalf.

As I have often remarked that in my experience of sixty-four years of exclusive work in artificial dentures, the expansion of plaster has not given me any trouble, and the reason why, from my standpoint, is, as it appears to me, a very simple one. It is impossible for the plaster in a tray to expand against the flanges, and utterly impossible for it to bend the thick flanges, although Dr. Spence says it does, and the evidence is that, on removing the impression from the cup, it cannot be replaced.

It does not prove anything of the sort; if it cannot be replaced it shows expansion after removal.

As the plaster impression cannot expand *against* the walls of the tray, there is only one thing it can do, and that is to expand *inwardly*. No one can deny that. What follows? Why, simple contraction of the opening is the inevitable result. It seems to me nothing can be more simple. Consequently the plaster model from that opening is just that much smaller than the jaw, a trifle only.

Theories about the unequal expansion of impression walls of different thickness I will not discuss, for, like many theories, no proof can be adduced, and it is practically of no account, at least in my long experience.

By taking a plaster impression, satisfying myself it is correct, carefully filling and removing, building up with flaring sides, shellacing, placing the relief over the hard center, molding, casting a Babbitt Metal die, I find the plate swaged on that die fits the plaster model snugly, and as that represents the jaw, I find the plate fits the jaw snugly, without further attempts at fitting with pliers and burnishes.—L. P. Haskel, *The Dental Digest.*

THE RETENTION OF LOWER PLATES BY ATMOSPHERIC PRESSURE.

(The editor of this magazine saw this method demonstrated and on a patient whose lower plate apparently had suction; at least it "snapped" when lifted from the lower tissues. Why not use compressed air or cold water to partly chill the impression material, rather than a fan?—Editor of *Dental Digest.*)

In order to secure retention by atmospheric pressure for a lower plate, as demonstrated at the recent union meeting of the Seventh and Eighth District Dental Societies, of the State of New York, held at Rochester, first see that the jaw has no undercuts; if there are any such they should be removed surgically. When the alveolus is thoroughly healed the impression may be taken in the following manner, and in the taking of this impression lies the secret of securing retention. As a material for taking the impression, I use modeling compound.

After finding a tray of the proper size and shape for the case in hand, take a little more material upon the tray than for an ordinary impression—this is to prevent the necessity of the tray coming in close contact with the tissues, which would cause an uneven compression of the soft parts.

While the impression material is quite soft, place it in the mouth and press it down about three-quarters of the distance you desire it to go, then stop and hold it there steadily until it cools a little. During this interval I have my assistant use a little rotary fan in the dental engine, directing the cold air upon the impression material; this chills the outer layer of the material and keeps it from flowing away from the tissue when the second pressure is put upon it. I usually wait about one or two minutes for the first cooling, or until it takes five or ten pounds of pressure to force it down one-eighth of an inch further, then hold again very steadily with about one-half the amount of pressure it took to force it down the last time, until it is quite hard. Remove and chill the impression in cold water and pour immediately.

If this method is followed out carefully, the denture being made upon this model in the ordinary way, you will find, when the plate is put in the mouth, that it will stick, because in taking the impression the soft, compressible tissues at the point where the margin of

the plate comes, as indicated by the line on the model, were compressed uniformly, and the plate having the corresponding tightness along the border when pressed down in the mouth seals itself in the soft tissues by preventing the air from getting in under its margins.—D. H. Young, *Dental Brief.*

EROSION INFORMATION WANTED—A REPLY.

Dr. Arnold, in his request for information concerning the treatment of erosion in the August number of the *Digest,* seems to have confused erosion and hypersensitiveness of the teeth. The method he gives as his own practice, as I understand him, relates to sensitiveness of the teeth, due, it is presumed, to gum recession. Erosion is a loss of tooth tissue, due to causes at present unknown. How it is brought about seems to be fairly well explained, but why the cause should exist at all, why almost exclusively confined to one period of life, and its erratic behavior, has so far baffled the keenest observers.

While erosion is at times accompanied by hypersensitiveness of the teeth affected, quite as frequently it is not, especially a short time after its first onset. Sometimes remedial measures appear to arrest its progress, at other times it steadily progresses in spite of all that has been done. It is not always continuously progressive. Quite frequently it stops for a while, and may have long periods of rest, so it is not always safe to assume that its arrest is a result of treatment.

Sensitiveness of teeth whose roots are exposed by gum recession is quite another matter, and far more tractable. It has been my practice for many years to recommend in such cases the local application of sodium bicarbonate, pressing the dry powder between and around the teeth. A few applications usually give prompt relief. The constant use of phenol sodique, diluted so as not to be unpleasant, and freely used with the tooth brush, or as a mouth wash, has proved very satisfactory in keeping denuded teeth comfortable. For several years I have been recommending sodium bicarbonate as a tooth powder, and am favorably impressed with its effectiveness, especially in cases where erosion or gum recession is marked. It is at least harmless.

I am disposed to ask whether oral sterilizing is not being carried

too far, whether it is not being used injudiciously, and without really understanding what it means. To sterilize is to kill. All germs are not bad germs, and some germs are bad only when out of place. When we undertake to sterilize a tooth or a portion of a tooth, by forcing the sterilizing agent into its tissue, are we making that tooth a better tooth? If we succeed, we have a dead tooth, and a dead tooth is soon lost. A devitalized tooth, so-called, is not dead. It is very fortunate that it is almost impossible to thoroughly impregnate a tooth while in the mouth with any sterilizing agent. A surgeon floods the field of operation with a sterilizing agent and thereby obtains wonderful results. He does not, however, endeavor to force mercury bichlorid into the tissues on which he operates, Now and again some is absorbed; then, there is another story to tell!

It will be interesting to know whether Dr. Arnold finds that the paraffin treatment arrests the loss of tooth substance by erosion. The late Dr. Bonwill was, perhaps, the first to suggest paraffin as a tooth decay arrester, flowing it around fillings before removing the dam. I have used it in children's teeth as a kind of "breaking-in operation," quite painless in its application, and at times surprisingly effective.

The question should be more explicitly stated. Erosion may be progressing rapidly without the least discomfort, teeth may be exquisitely sensitive and no erosion. Remaining comfortable is no sign that the erosion is arrested, a return of sensation is no sign that it has recommenced. How to arrest erosion is a vexed problem. As the problem now stands it seems to call for other treatment than mere operative precedures. Yours truly, William H. Trueman—*Dental Digest.*

DON'TS IN THE USE OF SILICATE CEMENTS.

Don't attempt to insert the filling until the toilet of the cavity has been made. A bath of alcohol or chloroform, followed by thorough drying, is requisite.

Don't forget that absolute cleanliness and dryness of hands, instruments, slab, and cavity are essential, and that chemical porcelain is a material of great delicacy. As one of the manufacturers says, "If you think an impure thought, you will spoil the product."

Don't use the same slab on which you mix borax, oxy-phosphate of zinc, oxy-chloride of zinc, copper, cement, treatments, etc. Have a separate slab, preferably of petrified wood, agate, plate glass, or highly-glazed tile, and use for silicate cement only. Always use an agate spatula. Discoloration, even to inky blackness, of some silicate fillings may be traced to the use of a slab on which other cements have been mixed with a steel spatula; the combination of phosphoric acid and the steel spatula leaves a trace of iron phosphate on the slab which impregnates the silicate and eventually causes discoloration.

Don't, under any circumstances, use a steel spatula in mixing, or steel instruments in inserting the silicates; if you do, failure is assured. Agate, bone, celluloid, or possibly hard wood instruments are indicated.

Don't use vaseline. If you are skillful and take a little pains you can insert the material properly without lubricating your instruments. In contouring and finishing, your strips or discs may be slightly oiled with cocoa butter—sufficient to carry a little of the powder from which your mix is made. More fillings have become discolored by the incorporation of vaseline than from all other causes combined.

Don't fail to pack your filling, after it has been thoroughly mixed, firmly against the cavity wall and well into the retentions. Remember that the silicates have little adhesive properties. There is a psychological moment for the insertion of the material which the operator must learn by experience. It should not be inserted while of a creamy consistency, but should be thoroughly and stiffly mixed and worked rapidly. The contour and margins should be finished, if possible, at the time of insertion, and before the material is thoroughly set. If this is done, the surface of the filling will have a polish or gloss as perfect as that of a piece of baked porcelain.

Don't wash the surface of the filling, after its insertion, with alcohol just prior to coating with paraffin, as some manufacturers advise. Alcohol is a solvent of phosphoric acid, and causes a deterioration of the exterior surface. This causes the surface to lose a certain amount of its density, and thus destroys to a degree the translucency which is desired.

Don't fail after the filling has set—which requires from twenty to thirty minutes, during which time the rubber-dam must be kept in place—to flow a coating of melted, white paraffin over the filling, using care not to disturb it when removing the dam. This makes a coating saliva-proof for several hours, allowing a perfect chemical reaction to take place.

Don't use sand or emery paper discs, stones, or finishing burs to finish the thing. If skill and delicacy are employed, overhanging margins will be avoided. Sand-paper discs and other abrasives leave the filling porous on the surface, which invites penetration of stains and subsequent discoloration. If the filling requires to be finished at a subsequent sitting, use a rubber cup on engine handpiece, filled with vaseline and some of the original silicate cement powder of which the filling was made. This will bring out the natural color and translucency of the filling.

Don't attempt large contours where there is direct stress in mastication.

Don't be inconsistent, and don't expect immediate success from the very beginning. Remember that this material, like all other materials in dentistry, has its placee, and must be experimented with and known before success can be expected.—B. L. Thorpe, *Dental Brief*.

ANTISEPTIC SPRAY FOR TEETH AND GUMS.

In cleaning teeth I frequently follow the stick and ribbon floss with the brush wheel used upon the coronal surfaces. After this is all done, I use an antiseptic spray under a pressure of thirty pounds, and go all over the teeth, between them, and especially under the gum margin, to thoroughly wash out any debris that may be left. The spray I use is echefolta, 1 ounce; dioxygen, 5 ounces, and water, 4 ounces.—*J. V. Conzett in Review*.

DENTISTRY—DUTY AND OPPORTUNITY.

PAPER I.

Recently a young dentist opened an office in a town of 3,000 people. It was the only town in a prosperous farming community of about 10,000 people. There was a dentist already located there, and the consensus of opinion was that one dentist was enough; that there was not enough work for two, and that the entrance of a dentist was an intrusion.

That represents the view of the public. Recently I asked the dean of a dental college how his institution was flourishing, and he told me that there were fewer students each year; that they were harder to get, and gave as his reason that the profession is overcrowded.

That is the view of the colleges.

I have talked with dozens of dentists, and they have unanimously concurred in the opinion that there are too many men entering the profession, and that they are simply taking practice from each other. They advocate raising the standard of entrance in the dental colleges, to keep the number of graduates at the minimum, giving the reason that there is barely enough work now to go around.

That is the view of the practitioner.

Questioning the students of several dental colleges as to their future plans reveals anything but enthusiasm on their part. Some are looking forward to work in dental laboratories; some expect to seek a foreign field; a number hope to become salaried assistants, and a few say frankly that if they can find something better to do they will never practice.

That is the students' view.

A gentleman, in a conversation recently, said that he used to spend several months each year in visiting cities and towns and the high schools, with the purpose of inducing students to enter a certain dental college. His success for years was pronounced, but now, he said, he wouldn't undertake such a mission, for young men are not interested in dentistry. Other fields are more inviting. Some young men are going into medicine; some choose law, and a great number are attracted to mechanical and engineering courses; but they don't take to dentistry, because they think it is crowded and the compensation too small.

That is the view of the average young man in choosing his vocation.

What is the matter? Has dentistry as a profession failed to realize its earlier promises? Is the field limited because the profession can be of but limited service to humanity, or has it served the public indifferently?

Let us consider some facts. Not one person in ten ever sees the inside of a dental office, save, perhaps, to have a bothersome tooth extracted. Much of the dental work throughout the country consists in making plates—which means that a vast number of persons visit the dentist only for extraction and substitution. Eliminating these persons, and regarding only those who systematically and regularly have their teeth cared for by a dentist, we have from five to eight per cent of our entire population.

Go over the accounts of the average dentist, and, eliminating extractions and plate making, they will not average 200 accounts per year.

There are about 40,000 dentists in the United States, but not more than 30,000 of them are in active practice. That means that in the entire country only about 6,000,000 people have their teeth periodically examined and the necessary work done—less than eight per cent of the entire population.

When these facts were recently laid before a dentist of national prominence, he said: "The trouble is that people haven't the money to spend on their teeth."

The answer to that is that it manifestly isn't true. Most of the people have the money to spend for the things they want very much. People with bad teeth ride in automobiles. Many buy pianos and parlor organs, jewelry and ornate furniture, who never visit a dental office. No person can buy everything he wants, for wealth is a relative thing. But every person aims to supply his chief needs or cravings.

In other words, we think nobody will deny that at least fifty per cent of our people could, and would, find the means to pay for dental work, if they fully realized its importance. Its necessity has not been sufficiently impressed on their minds.

To illustrate: Recently a young working girl came into a dental office. She wanted a bridge with three front teeth. She haggled over

the price, and the dentist cut it to the lowest possible figure. He told her that there were several back teeth badly decayed, but that he could save them at a little cost by cement or amalgam fillings. She refused to have the work done, as it would cost too much, "and they didn't show anyway." Then she inquired the cost of having gold fillings placed in each of the artificial teeth, and insisted in having it done. She had the money to pay for what she wanted! And she represents a type.

The education of the public at present extends to the care of the front teeth, for they can be seen—just as in many homes the parlor contains nearly all the furniture. When the public education extends to the back teeth, public health will improve and dentists will be busy.

Now suppose the public were led to place the right estimate on dentistry, and should come to realize its necessity. Suppose that, beginning with the deciduous teeth, all persons regarded the systematic care of the teeth as necessary to general health, and patronized the dentist as they do the doctor. Suppose that the people who had the money paid for their work, and the others were provided for in hospitals and dispensaries—what would be the result? Instead of 30,000 active practitioners we should require 300,000. The dental colleges would be crowded and any dentist who wasn't busy would have to charge it to himself.

From the foregoing there are several palpable truths to be impressed. In the sense of taking care of the dental ills of humanity the profession hasn't made good. It has skimmed over the surface. It hasn't impressed the masses with its worth. It has been content with ministering to a few and has despaired of reaching the many. The individual has done his work well; the profession has lacked imagination and has failed to get into the public mind an idea of what the dental profession has to offer humanity. In this regard the medical profession is far in advance of ours. From the attitude of aloofness the physician has assumed the position of an educator and reformer. He is an evangel and a publicist. The medical profession has taken the responsibility of educating the public in matters of health and sanitation. And it has put aside all mock-modesty, frankly admitting that if it means more work for the doctors, it is work that ought to be done; and that answers all criticism.

Desire controls all human action. We can't sell anything until we have shown it to be necessary or desirable. There are many strings to play upon, and the business man uses them all. Pride, fashion, custom, knowledge—all are factors in deciding, action, for all help to influence human desire.

If there are countries where fashion decrees that the teeth of all persons shall be filed to sharp points; if in other places they must persistently be stained black, is it not possible in a civilized community to firmly establish the fashion of perfect teeth—keeping them as nearly normal as possible?

Two-thirds of the parlor organs and pianos that grace homes throughout the country are not purchased through any desire or expectation of enjoying their music. In most instances they are regarded as ornaments or to allow somebody to "show off" occasionally. Yet the manufacturers find no difficulty in disposing of these instruments, even to the very poor. They appeal to human pride and take advantage of the requirements of fashion. If an agent sells one instrument in a country community he will sell a dozen more. People are going to have what others of their rank and station have, and continue to crave what the more fortunately situated possess—and will get that, too, if their means ever permit.

Now about at this point somebody will rise to ask whether it is proposed that the dental profession shall recognize such human instincts and proceed to exploit their profession on so low a plane? The answer is that we can't make people over, and must work with human nature as we find it. To make rabbit pie we must first catch our rabbit; and to influence a person along any line we must take him on his own ground, get his point of view and then lead him to ours.

But the profession has firmer ground for an appeal to the public. It has had a great opportunity and a great duty—and it hasn't risen to the occasion. Fundamentally its mission is the conservation of public health; on this it must succeed or fail. It may appeal to pride and fashion through its esthetic feature, but it will finally triumph in proportion as it ministers to human health and comfort. If there is anything on earth that people will pay money for it is to be well, to be liberated from physical discomfort. The patent medicines they buy would float battleships. They may be humbugged; they may be induced to buy water with a little coloring matter; but

this speaks eloquently of the terror of disease and the intense longing to be well.

Has dentistry anything to offer? You will arise in chorus and tell of the ills it could help humanity to avoid or of those it could relieve or minimize. And you will probably add: "Everybody knows about it."

But there is where you make a mistake; very few know anything about it. You have discussed this phase in your dental societies and occasionally in dental journals, but even the educated masses are ignorant of it. About all the public knows is that if a tooth aches it will cease aching when it is pulled; that if teeth are missing it interferes to an extent with mastication; and if the front teeth are decayed, the appearance is not pleasing.

The reason that dentistry has not progressed further in the public esteem is not that it hasn't developed more and greater specialists, but that it has allowed the public knowledge of its usefulness to stop where it should have begun.

If we think for a moment we will see how dense this ignorance is. The teachers in our public schools have no conception of the part defective and diseased teeth play in interfering with the progress of the work of their pupils. Any honest physician will admit that thousands of persons are taking drugs and nostrums for stomach troubles that are due to defective or diseased teeth. We assume that the public knows, but have only to question those we meet to discover our error.

All of this leads down to the proposition that we must educate the public along the lines of our specialty. It can't be done in a day. The ground will not be covered by a few papers read before our dental societies—for the enlightenment of those already informed. We have our opportunity; it means the doing of more work that ought to be done. It means an advance of dentistry in the public esteem because of increased usefulness. Occasionally some member of the profession performs a surgical operation of great delicacy, and we get up and discuss it under the impression that it will advance our profession in the esteem of the public. But the standing of a profession is not based on the occasional extraordinary feats so much as on the efficient service of its many humble members quietly performed from day to day. We are of a supersentitive aggregation. The term "tooth

carpenters" causes us to fly into a rage, when it means nothing but badinage, and it is on the "tooth carpenter" that the reputation of the profession rests.

There is a type of dentist who apes the airs of a physician, and delights in "prescribing" for his patients. But what the mass of the people need is to have teeth filled, treated and cared for, crowns fitted and bridges set. The profession will hold its place in the public esteem in proportion as these things are done and done well. And the reason is plain; there is more of this kind of work that needs doing than any other kind. It is the reason for dentistry. Our specialists honor us and confer a boon upon the public; but our place in human affairs depends upon the average dentist who does the ordinary drudgery from day to day.

The above may be regarded as a slight digression, but it leads to the inevitable conclusion that dentistry requires publicity. The public must be more generally and fully informed of what we have to offer. It must be taught to understand its own needs. It must come to realize the necessity of greater attention to the teeth, and that the employment of dentists is imperative.

Who shall undertake this publicity? Certainly only those who have the technical knowledge. The dental profession is eager for its opportunity; but has it no duty? You denounce the individual who advertises because he is seeking to exploit himself. But is there no obligation on the part of the profession to obtain greater publicity, with the object of exploiting dentistry rather than individual dentists?

Finally, if the public needs fuller information, who is charged with the duty of imparting it but the dentists themselves?

Next month I shall discuss "Dental Ethics."—ICONOCLAST. (*Dental Brief.*)

COMMISSIONS.

You must obtain patients on your merits and not under any circumstances by offering or paying commissions to any one whatsoever. Commissions offered to a professional brother mean bribery, detested by all honorable men. Commissions exacted are equivalent to the demand of the road agent of the plains—"Stand and deliver." Commissions paid by you mean cowardice; you yield to

the demand from your professional brother under the implied threat of a loss of bread and butter. It is nobler to go hungry than buy bread at the sacrifice of professional dignity and honor.—*Norman W. Kingsley in American Orthodontist.*

FIELD OF USEFULNESS OF SILICATE CEMENTS.

The silicate cement seems especially adapted to the many small cavities in the incisor and bicuspid regions where metal would be unsightly, and where the retention of minute porcelain inlays would be uncertain. These labial, buccal, or approximal cavities are not exposed to stress of wear, but subject to the chemical influence of mucous secretions and other fluids of the mouth. An insoluble plastic porcelain in the region named, even though lacking somewhat in edge strength, but possessing the other qualities of porcelain, seems almost ideally suited for our purpose. Many of the minute approximal cavities, where much cutting would be necessary for inlays, may be perfectly filled with this substance at a minimum loss of sound tooth structure, and aside from this consideration, the patient will be saved much of the fatigue and pain of the larger operation. It is also a great advantage not to be hampered with the usual film of opaque cement, which with the inlay interferes with the transmission of light, and by gradual solution leaves the porcelain edges more or less unsupported and liable to chip.

It has been my practice heretofore to confine the use of this material to the small cavities mentioned, partly because I doubted its ability to withstand a crushing stress, and partly because in a large cavity in which a well-constructed porcelain inlay may be used, it is possible with the inlay to secure the nice blending of shades necessary at different parts of the tooth. In talking recently with many excellent operators, I find that they have not hesitated to fill large compound cavities and restore contours which have successfully withstood the stress of mastication. The possibility of so using the silicate cement for almost all purposes of restoration in cavities of decay is too new and too broad a field for me to consider here.—W. B. Dunning, *Cosmos.*

IOWA STATE DENTAL SOCIETY.

The forty-eighth annual meeting of the Iowa State Dental Society will be held at Des Moines, May 3-4-5, 1910. Besides an especially strong program, plans are being made for a large dental manufactures' exhibit. Display space free of charge.

W. G. CRANDALL, Secretary,
Spencer, Iowa.

MONTANA STATE DENTAL SOCIETY.

I am pleased to announce that the next annual meeting of the Montana State Dental Society will be held May 6-7, 1910, in the city of Great Falls, Montana. Preparations are making for a good program and the indications are that it will be the best meeting of the sort that the profession of the state has ever held.

Sincerely,
DR. R. L. SPAULDING, Secy.-Treas.

MISSOURI STATE DENTAL ASSOCIATION.

The forty-fifth annual meeting of the Missouri State Dental Association will convene in St. Louis, May 23, 24, 25 and 26, 1910. This meeting is going to be an epoch in the history of the Missouri Dental Association, the committee on reorganization will have completed their work by that time and as a result the attendance will be double that of former years. Drs. G. V. Black and J. V. Conzett will be guests of the association, besides the clinics alone will be the largest ever given at this association.

J. F. WALLACE, *Secretary,*
Canton, Mo.

KENTUCKY STATE DENTAL ASSOCIATION.

The forty-first annual meeting of the Kentucky State Dental Association will be held in Louisville, May 26, 27, 28, 1910.

An unusually interesting and profitable program is being arranged for this year, and a cordial invitation is extended to all ethical members of the profession.

W. M. Randall, secretary, corner Brook and Broadway, Louisville, Ky.

ALUMNI ASSOCIATION OF THE COLLEGE OF DENTISTRY.

The Alumni Association of the College of Dentistry, University of Illinois, will hold their third annual clinic and meeting on Wednesday, June 1, in the college building, corner Harrison and Honore streets. This will be a strictly alumni clinic but a cordial invitation is extended to ethical members of the profession to attend the clinics.

FRANK J. RYAN, Secretary.

THE MICHIGAN STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants for registration will be held at Ann Arbor, beginning Monday, June 20, and continuing through to the twenty-fifth. Application must be in the hands of the secretary at least fourteen days before the examination, and should be addressed to A. W. Haidle, secretary-treasurer, Negaunee, Mich.

INDIANA STATE DENTAL ASSOCIATION.

The fifty-second annual meeting of the Indiana State Dental Association will be held in Indianapolis, May 17-18-19, 1910, at the Claypool Hotel. This promises to be a great meeting.

Huntington, Ind. OTTO U. KING, Secretary.

THE NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The twenty-eighth annual session of the National Association of Dental Examiners will meet at the New Savoy Hotel, Denver, Colorado, commencing Monday, July 25, at 10:00 a. m. The rates will be $2.00 per day for one and $3.00 per day for two persons in room, European plan; large room for one or two with private bath $4.00 and $5.00 per day.

Meeting and Committee rooms at the service of the association free and every accommodation extended. An early mail reservation is requested, the time being the busy season. A full representation from every state in the United States is desired.

J. J. Wright, D. D. S., president, Wells building, Milwaukee, Wis.; Charles A. Meeker, D. D. S., secretary, 29 Fulton street, Newark, N. J.

NEW YORK ALUMNI ASSOCIATION, XI PSI PHI FRATERNITY.

The annual dinner of the New York Alumni Association, Xi Psi Phi Fraternity will be held at the Hotel Manhattan, Madison avenue and Forty-second street, New York City at 8:00 p. m. on Saturday, April 2, 1910. Arrangements have been made for every Alumnus residing in or about New York City, and it is hoped that all will take advantage of this opportunity to meet their old classmates again.

PERSONAL AND GENERAL

Dentist Elopes.—Dr. Charles W. Spies, a graduate of Washington University, and practicing dentistry in St. Louis, Missouri, eloped recently with Miss Bertha Dahmer.

Wettengal-Sumner.—Dr. Harry W. Wettengal of Rockford, Illinois, and Miss Alice Anna Sumner of Pecatonica, were married Monday, March 7th.

Born With Teeth.—A child was born in one of the mining camps in Colorado recently with two well developed teeth. They were of the size usually found in a child 8 monhs old, and were side by side on the upper jaw. The teeth were removed by the physician when he discovered that they were causing the child pain.

Dentist Injured.—Dr. William J. Moe of Eau Claire, Wisconsin, was swedging in his laboratory recently when a piece of steel hammer flew up and cut his arm. The injury was quite serious and resulted in his being deprived of the use of the member for a few days.

Patient Sues Dentist.—A judgment for $3,000 was recently secured against Dr. A. A. Shaw of Los Angeles, California. It is alleged that the dentist in extracting three teeth let one of the molars slip down into the patient's lung where it remained for two years, when in paroxysm of coughing the tooth was ejected.

New Law Upheld.—Dr. F. M. Robinson, a graduate of the Northwestern University, who had refused to secure the legal license under the new state law in South Dakota, has been arrested and found guilty for practicing without a license. A verdict of guilty with recommendation of clemency was rendered.

Dentist Arrested.—Dr. George H. Westlake, formerly a dentist, of Springfield, Illinois, and who practiced at Virden, same state, and who had been wanted on a charge of embezzlement, has been arrested and taken to the city prison in Springfield, Ill. Dr. Westlake has recently returned from a trip to Central America where he claims to have had mining interest. He also claims that he has stolen nothing and that he will make a full accounting and that any shortage will be fully settled.

Dentist Counterfeiter.—Dr. J. R. Dedge of Valdosta, Georgia, has been bound over by the United States commissioner on the charge of being implicated in an alleged counterfeiting scheme. This has caused quite a sensation in and around Valdosta, Georgia, where the dentist had been practicing for a number of years.

Dentist Sued for Divorce.—Dr. Walter W. Schnittger of St. Paul, Minnesota, has been sued by his wife for a divorce, alleging in the complaint that on several occasions her husband struck and abused her and drove her into the street.

EDITORIAL

All over the country there seems to be an awakening in the dental societies of a sense of our professional obligation to the public welfare; a sense of something due to suffering humanity other than service only to those who can pay our fees. If we ever expect to be recognized and appreciated by the public as an important, scientific and liberal profession we have got to go farther than we have along this line of public welfare. But with this obligation before us it must be remembered, too, and made plain to all, that as compared with free medical dispensatories now well established, dentistry is largely a matter of difficult and trying mechanical technique, under trying situations and exacting conditions by trained hands, and dental treatment, in the main, can not after diagnosis be delegated to a nurse or a dispensing official, not to mention the important factor of time that must be consumed in performing a great portion of the required service for the worthy poor in mind, as well as for others.

However, these things being duly considered together with the fact that defective and uncared for teeth of thousands upon thousands are seriously contributory, if not primarily the cause of much of the general ill health of communities, the time has come when some concerted, well organized and carefully planned measures must be adopted by our profession to show to the world that dentistry is very important in the conservation of general health; and that we will in some way reach out a helping hand as becomes us for the betterment of communal health interests, and especially among children who can afford to pay little or nothing; and provide also for the extension of such dental knowledge as shall be of universal benefit.

At the recent election of officers of the Chicago-Odontographic Society, Dr. Frank H. Zinn, who has so long and so ably served as secretary, was promoted by a unanimous vote to the presidency for the ensuing year. This is an honor due and well deserved, for no

member has taken more interest or given more unselfish attention to the good of society.

There is no other dental society of a like character, perhaps in the world, so large in numbers—over a thousand—and so active and well equipped for any campaign for any good purpose it may be likely to undertake. It is, of course, a component of the Illinois State Dental Society, in accordance with wise plans in state organization adopted not so long ago.

But the State Society, *per se,* though an organization concentrating the professional interests of the state, has no such opportunity, influence or power of doing public good as has this unusually strong component, occupying as it does such a great populous center, composed of all sorts and conditions of humanity, except as a state society may be better able to wield a state-wide influence in any desired legislative enactment.

It is to be hoped that this incoming administration will be fully awake to what the Chicago-Odontographic Society might be and should be as foremost in this forward step. "Give to the world the best you have and the best will come back to you."

The year should most surely see some actual work done along the line referred to, and the sooner we come to the mistakes and pitfalls of the untried, the sooner we will learn how to avoid or overcome them in future.

So far in the history of the Chicago-Odontographic, and in the prior organizations from which it sprung for that matter, petty and selfish politics, or office seeking ambitions, the bane of many organizations, and especially of one so large, have been readily side tracked, relegated to the rear or quietly stepped on without unpleasant situations of import cropping out. It is to be hoped that such a sentiment may prevail among the larger and better element of the society for years to come. Let the society seek the men. Every thought and every hand in the society should be turned toward the general welfare and the great and good things that such an organization may be able to do.

NECROLOGICAL

Dr. James Washington Bartlett, who for fifty years practiced his profession in Boston, Mass., died March 5th, following an operation performed at the Charles Gates hospital. He is survived by a widow and a son who is living in Colorado Springs, Colorado. The doctor was a great lover of music and did much for various musical organizations, as well as being an advocate of advanced methods in modern dentistry.

Dr. Gilbert S. Treat, a practicing dentist in Polo, Illinois, dropped dead March 4th. Death was due to heart trouble. He was fifty-one years of age and is survived by a wife and two children.

Dr. Merit Wells, who for forty years has practiced dentistry in Indianapolis, Indiana, died March 3d. Dr. Wells was 77 years old, being born on a farm in Jennings county, January 18, 1833. He studied dentistry in Cincinnati and opened an office there when there were only five other dental offices in the city. In 1902 he gave up his profession and retired to his farm just outside of the city. Dr. Wells was one of the organizers of the Indiana Dental College, was treasurer of the Indiana State Dental Association for many years, and was a charter member of the Board of Trade. He is survived by a wife and six children.

Dr. J. W. Adams, of New Orleans, Louisiana, died March 6th. Dr. Adams was going on his seventy-ninth year, but had not been in active practice of his profession for about ten years. Dr. Adams was a veteran fraternity man having been past grand master of Odd Fellows as well as being a Mason for fifty-five years. He is survived by a widow, one son and one daughter.

Dr. Calvin E. Hazen, a dentist in Newkirk, Okla., died suddenly February 23d of paralysis of the heart.

Dr. Emery M. Cheadle, a graduate of the Chicago College of Dental Surgery in 1886 died recently at his home in Forest Grove, Oregon. The doctor was also a graduate in surgery and medicine and practiced for several years in Seattle before taking up dentistry. He also practiced dentistry at Spokane, and while there was elected a member of the State Dental Board, serving for two years.

Dr. Frank W. Satterlee, for years a practicing dentist in Chicago died at his home in LaGrange March 10th. He was 58 years old and was one of the men who served under General Sheridan in patroling the streets of Chicago after the great fire of 1871.

Dr. Edwin J. Dupeire, for many years the only dentist in Algiers, Louisiana, died recently after an illness of but three days. Dr. Dupeire was an inventor of some note, and at the time of his death was busily engaged in working on some plans for an airship. He also invented the parlor baseball game which has become so popular in the country.

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Copy must be on file in our office by the 15th of the preceding month in which insertion is desired.

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